

Engineering Conferences International ECI Digital Archives

Integrated Continuous Biomanufacturing II

Proceedings

Fall 11-2-2015

Laboratory scale continuous linear purification as a development tool for recombinant blood protein processing, using chromatographic resins and membranes

Michael Hughson

LECC/COPPE/UFRJ, mdh@peq.coppe.ufrj.br

Rimenys Carvalho

LECC/COPPE/UFRJ

Thaynna Araujo Cruz

LECC/COPPE/UFRJ

Leda dos Reis Castilho

LECC/COPPE/UFRJ

Follow this and additional works at: http://dc.engconfintl.org/biomanufact_ii



Part of the [Biomedical Engineering and Bioengineering Commons](#)

Recommended Citation

Michael Hughson, Rimenys Carvalho, Thaynna Araujo Cruz, and Leda dos Reis Castilho, "Laboratory scale continuous linear purification as a development tool for recombinant blood protein processing, using chromatographic resins and membranes" in "Integrated Continuous Biomanufacturing II", Chetan Goudar, Amgen Inc. Suzanne Farid, University College London Christopher Hwang, Genzyme-Sanofi Karol Lacki, Novo Nordisk Eds, ECI Symposium Series, (2015). http://dc.engconfintl.org/biomanufact_ii/106

This Conference Proceeding is brought to you for free and open access by the Proceedings at ECI Digital Archives. It has been accepted for inclusion in Integrated Continuous Biomanufacturing II by an authorized administrator of ECI Digital Archives. For more information, please contact franco@bepress.com.

LABORATORY SCALE CONTINUOUS LINEAR PURIFICATION AS A DEVELOPMENT TOOL FOR RECOMBINANT BLOOD PROTEIN PROCESSING, USING CHROMATOGRAPHIC RESINS AND MEMBRANES.

Michael Hughson, Laboratório de Engenharia de Cultivos Celulares (LECC)

Programa de Engenharia Química / COPPE
Universidade Federal do Rio de Janeiro (UFRJ)

mdh@peq.coppe.ufrj.br

Rimenys Junior Carvalho, LECC/COPPE/UFRJ

Thayana Araujo Cruz, LECC/COPPE/UFRJ

Leda dos Reis Castilho, LECC/COPPE/UFRJ

Key Words: Process development, chromatography, membrane capture

Continuous processing offers significant advantages for the processing of unstable recombinant products such as therapeutic plasma proteins. As such we have established a development platform to assess potential purification steps as part of a continuous linear process using a standard AKTA Explorer. Following a consistent format of IEX membrane to HIC membrane to affinity resin, we were able to rapidly investigate multiple purification pathways for a recombinant blood protein. Using membranes as the first two steps enables a 3-step purification process to be carried out in 3 to 4 hours, with a total turnaround of 5 to 6 hours including regeneration and re-equilibration, at laboratory scale and depending on the specific pathway. This development method allowed for a direct comparison between multiple purification pathways, assessing overall recovery, pathway consistency, product quality and product purity over the 3 steps. Ligands tested include cation & anion exchangers, phenyl, phenyl boronate and an immobilised affinity peptide. It is envisaged that once a purification pathway has been decided upon, processing speed could be around 1 L per day without significant scale-up.